

Environmental/Economic Power Dispatch Using Multiobjective Evolutionary Algorithms: A Comparative Study

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Power Engineering Society General Meeting, 2003, IEEE; Publication Date: 13-17 July 2003; Vol: 1, On page(s): - 925 Vol. 2; ISBN: 0-7803-7989-6

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Summary

A comparative study of newly developed Pareto-based multiobjective evolutionary algorithms (MOEA) applied to a nonlinear power system multiobjective optimization problem is presented in this paper. Specifically, Niche Pareto genetic algorithm (NPGA), nondominated sorting genetic algorithm (NSGA), and strength Pareto evolutionary algorithm (SPEA) have been developed and successfully applied to environmental/economic electric power dispatch (EED) problem. These multiobjective evolutionary algorithms have been individually examined and applied to the standard IEEE 30-bus test system. A feasibility check procedure has been developed and superimposed on MOEA to restrict the search to the feasible region of the problem space. The results of MOEA have been compared to those reported in the literature. The comparison shows the superiority of MOEA to the traditional multiobjective optimization techniques and confirms their potential to handle power system multiobjective optimization problems.

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